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ZOOLOGY.

Amœba coli not Pathogenic.—This *amœba* has been met with by Sig. O. G. V. Casagrandi and Sig. P. Barbagallo-Rapissardi¹ in cases of typhoid diarrhœa, simple intestinal catarrh, and in spasmodic dysentery, as well as in healthy persons, and the conclusions drawn were that it is not pathogenic but is a very useful guest, destroying the other organisms living in the intestine. Experiments with cats show that diarrhœa does not develop unless the intestinal canal is already in a catarrhal condition. *Amœba coli* will develop in them, but only because the dysenteric material injected sets up at the same time the condition necessary for development.

Bipalium kewense.—Mr. Woodworth's notes induce me to place on record the probable occurrence of this phanarian at Kingston, Jamaica. Some years ago, when resident there, I had brought to me an example which accorded perfectly with my recollection of the creature, which I had formerly seen at Kew. The longitudinal markings were distinct. While I have no serious doubt of the identity, I was ill at the time of receiving the specimen, and failed to give it the attention it deserved.—T. D. A. COCKERELL, Mesilla, N. M.

Egg-Laying in Sagitta.²—In the case of *Sagitta hispidula* Mr. F. S. Conant finds that the process of egg-laying takes place in the morning, in this respect differing widely from *Sagitta bipunctata*, which deposits its eggs at about sunset, as observed by Fol, and agreeing with *Sagitta hexaptra* as noted by Grassi. Variations in temperature affect the time somewhat, cold retarding the process.

The ova pass through the wall of the germinal epithelium into the oviduct, apparently through interspaces in the wall of this, undergoing by the way a progressive series of changes in shape. In the oviduct the ova remain from 20–30 minutes, their gelatinous envelope thickening meanwhile. Contractions of the ovary result in pushing the eggs backward towards the external opening, and when the pressure has become sufficient the plug closing this is forced out and the eggs are extruded in two linear rows (one on either side the animal) of only a few or as many as 60–70 eggs each. This does not differ essentially from the

¹ Catania, 1895. See J. R. M. S., p. 429.

²Ann. Mag. Nat. Hist., XVIII, pp. 201–214. Johns Hopkins University Circulars, xv. (1896) p. 82–4.

act of laying, as seen and described by Boreri in *S. bipunctata*, the sausage-form that these eggs pass through being given them in the latter case by pressure while still in the ovary.

Mr. Conant was unable to determine definitely the location where fertilization takes place, but supports Hertwig in affirming contra Grassi that no spermatozoa are found in the ovary. What little evidence he has indicates that fertilization takes place while the ova are in the duct between the exterior opening and the opening of the duct of the receptaculum seminis. Self-fertilization seems impossible.

The eggs when laid become attached to the sides of the dish by a gelatinous substance that facilitates handling, but collects dirt. In warm weather development to hatching takes place in about 36 hours, and then the animals are miniatures of the adult form, and all are as ready to devour their comrades as are the mature animals.—F. C. KENYON.

The Chætognaths of American Waters.—In his paper just cited Mr. Conant gives nine species as the total number known to occur in American waters. Among them he enumerates five new species added by himself. One of these has caused him to make some very pertinent remarks concerning the divisions of the old genus of *Sagitta* into *Sagitta*, *Krohnia*, and *Spadella*. He agrees with Béranek's criticism of the systems proposed by Langerhans, Hertwig, and Grassi, and like this author concludes, though under protest, to follow with Strodttmann the arrangement proposed by Langerhans. It would have been much better, however, had he obeyed the impulse that his new species produced, and described all nine as species of *Sagitta*, instead of sandwiching species of *Krohnia* and *Spadella* in irregularly between undoubted species of *Sagitta*. Or he might at least have placed the terms *Krohnia* and *Spadella* in parenthesis.

But, notwithstanding the doubt that arises as to which of the older arrangements to follow in placing Mr. Conant's new species, it should be remembered that after all any system of classification is very largely for convenience, and that in the present state of our knowledge, not only of this particular group of animals but of the fundamental laws governing the evolution of one form from another, any system proposing to show genetic relationship is at least only tentative, and often weakly so at that. In this particular case whether we should regard the number of fins with Hertwig, the so-called teeth, or with Strodttmann and Béranek, the sum of the characters as the determining features is still a doubtful matter. Judged from the standpoint of convenience the ar-

rangement given by Hertwig seems the best, and for that reason, if not for the sake of showing true genetic relationships, the synopsis below is given.

A. With caudal and with one pair of lateral fins, *Spadella*.

a. Anterior teeth wanting.

Posterior teeth many. Seizing-hooks 8-9. Length 35 mm. (According to Möbius). Taken off Martha's Vineyard, North Atlantic, *S. (Krohnia) hamata* (Möb).

b. Anterior teeth present.

1. Seizing-hooks 6. Anterior teeth 3-5; posterior teeth 5-7. Length 52 mm. North Atlantic. Lat 42°, 28'; long. W. 50°, 55', 30'', *S. maxima* Con.

2. Seizing-hooks 10. Anterior teeth 8; posterior teeth 18. A broad bilateral outgrowth of the epidermis distinguishes this from all others. Bahamas (Binnini), Messina, Naples, Madeira and Canary Islands. Length 10 mm.,

S. draco (Krohn) Langer

B. With caudal and with two pairs of lateral fins, *Sagitta*.

a. Posterior teeth wanting. Second pair of fins split posteriorly into 4 villus-like processes. Seizing-hooks 8. Anterior teeth 4-6; corona ciliata forming a peculiar triangle on head and neck. Tail equal half total length. Bahamas (Binnini). Length 4 mm., *S. schizoptera* Con.

b. Posterior teeth present. Fins entire.

1. Seizing-hooks 7-8.

a. Anterior teeth 3-4; posterior teeth 4-7. 2 external intestinal diverticula. Length 24-34 mm. Martha's Vineyard, Atlantic and Pacific Oceans, *S. hexaptera* (Orb.).

b. Anterior teeth 4-5; posterior teeth 7-10. No diverticula. Length 5.25 mm. Jamaica, *S. tenuis* Con.

2. Seizing-hooks 8-9.

a. Anterior teeth 4-5; posterior teeth 8-15. Caudal segment one-third total length. Length 7-11 mm. Jamaica, Bahamas, N. Carolina, *S. hispida* Con.

b. Anterior teeth 7-8; posterior teeth 10-12. Corona ciliata confined to head. Length 13-18 mm. Bahamas, *S. flaccida* Con.

4. Seizing-hooks 9-12.

Anterior teeth 5-7; posterior teeth 12-15. With both external and internal intestinal diverticula. Length 16-33 mm. Vineyard Sound, Gay head on English coast,

S. elegans (Ver.).

—F. C. KENYON.

New Central American Diplopods.³—Among a lot of chilopods and diplopods that Dr. Filippo Silvestri describes as collected by Dr. Festa at Guayra, Darien and Cuenca he describes the new species *Archispirostreptus guayrensis*, *Plusioporus festæ*, *Rhinocricus diversicauda*, *Oxygye varicolor*, *Ortomorpha festæ*, *Aulocodesmus angustalus*.

The genera *Oxygye* and *Aulocodesmus* are new. The former approximates very closely to *Rhinocricus*, but differs from that in having the anal valves produced into long straight spines. The latter approaches Pocock's *Odontopeltis*, but differs in the position of the pores, in the granular surface and the dorsal sulcus.—F. C. KENYON.

The development of the Wing-scales and their pigment in the Lepidoptera.⁴—The scales of the wings of Lepidoptera are shown by Mr. A. G. Mayer to be developed from modified hypodermis cells like the hairs of other arthropods. The pigment comes from the so-called pupal blood by a series of chemical changes. The colors of the adults are not formed at once, but all pass through a series, the first of which is a dull ochre-yellow. He succeeded by chemical means in making pigments from the pupal-blood or hæmolymp that were similar in color to the colors of the adult insects. These pigments react to chemical agents similarly to the pigments of the insects.

Dull ochre-yellows and drabs such as one finds among the nocturnal Lepidoptera are the oldest, the bright yellows, reds, and greens of the diurnal forms are derived by a complicated chemical process brought about in the parts most exposed to the light.—F. C. KENYON.

Rapid Growth of Apus.—From Spencer and Hall's⁵ account of the crustacea of central Australia we learn that not more than two weeks, and probably only a few days after the fall of rain, specimens of *Apus* were found measuring $2\frac{1}{2}$ to 3 inches in length. When it is remembered that the eggs of *Apus* must pass through a stage of drought before they will develop, this enormously rapid growth is truly remarkable. And the evidence of it is conclusive, if it be impossible for the mature or nearly mature form to pass through the period of drought, which certain forms, e. g., *Astacopsis* and *Telphusa* are known to be able to do.—F. C. K.

Steindachneria.—In 1888 the name *Steindachneria* was twice used to designate new genera of fishes.

Goode and Bean in Agassiz, Three Cruises of the Blake II, p. 26 (April, 1888) used the name for a macrurid taken by the Albatross off

³ Bull. Mus. Zool. Anat. Comp. Univer. Torino., XI.

⁴ Bull. Mus. Comp. Zool., XXIX, 209-36, 7 Pls.

⁵ Horn Scientific Exp., 1896, pt. II. J. R. M. S., p. 410.

the delta of the Mississippi River. The fish was mentioned in the following language: * * * *Steindachneria*, a macrurid with a high differentiated first anal fin, has been obtained by the "Albatross" in 68 fathoms." No specific name and no figures were published.

We used *Steindachneria* for a silurid genus inhabiting the rivers of southeastern Brazil in a paper issued July 18, 1888 (Proc. Cal. Acad. Sci. 2d. Ser., Vol. 17). The name was defined and referred to a described species. Mr. S. Garman called our attention to the previous use of *Steindachneria* by Goode and Bean. An examination of Goode and Bean's note showed that their name was a nomen nudum, neither described nor referred to any published species. On learning this we wrote Dr. Goode an apologetic note calling his attention to these facts and received the following in reply. "*Steindachneria* has never been published, though the diagnosis of the genus has been lying in MS. for nearly two years. So we will change the name. It is not of the least consequence." This was under date of Oct. 1, 1888. This intention to change the name was never carried out and in "Oceanic Ichthyology" (p. 419) which has just been received, *Steindachneria* is still retained for the macrurid and reference made to "Three Cruises of the Blake." The name *Steindachneria* being preoccupied for the cat fishes I would suggest the name *Steindachnerella* for the macrurid to carry out the idea of honoring the Custos of the Imperial Zoological Museum of Vienna.—C. H. EIGENMANN.

Mutilations of the Oregon Redfish.—The sores, frayed-out fins, and other mutilations which have been noticed upon the Chinook salmon and redfish by every one who has ever seen these fishes upon their spawning-grounds have been regarded by all as being due chiefly, if not wholly, to the injuries incident to the long journey from the sea. Coming so these Idaho lakes from the sea requires a journey of more than 1000 miles, and it is, in large part, through swift and turbulent waters and up dangerous rapids, cascades, and waterfalls against whose ragged and jagged rocky walls and bed the fish would often be thrown by the seething currents. That they could make this long and perilous journey unscathed could scarcely be believed.

In the shorter coastal streams of Oregon, Washington, British Columbia, and northward, the same mutilations have been observed and have usually, without sufficient reason, been attributed to the same cause. Until now it has, therefore, generally been held that the injuries are received by the fish while en route to the spawning-grounds. Our continuous series of observations at Alturas Lake during the entire period

of the breeding season shows, however, that this is not the true explanation. Among the hundreds of redbfish that we examined as they came up into Alturas Inlet from the lake not one possessed any sores, or had the fins frayed out in the least; every one was perfect in every way, so far as mutilations were concerned. Not only were all of those caught on the gill nets as they came up from the lake free from sores, but no sores were seen on any of the fish in the creek until some time after the spawning had begun. The first fish were seen July 24, but not until August 10 were any mutilated ones observed, and then only 3 out of 84 examined showed any considerable mutilations.

In marked contrast with this perfect condition of the fish as they arrive upon their spawning ground is that observed toward the close of the spawning season when scarcely a fish can be found whose fins are not badly frayed and upon whose body are not one or more large sores.

The manner in which the mutilations are really received was readily determined by watching the fish while spawning. The spawning-beds are usually in very shallow water, often only a few inches deep. These beds are of fine granite gravel and sand. There is more or less definite pairing off of the fishes, and each pair usually does all its spawning on a certain area, which may be called the nest. The gravel and sand of this area are moved about and piled up somewhat in heaps or rows as the fish scoop out shallow depressions in the bed; this scooping or moving of the gravel is done as the fish swims upstream over the bed with a rapid quivering motion of the body; during this act the body is always inclined to one side and the gravel is chiefly pushed in the other direction; after swimming across the nest in this way, the fish circles around downstream and returns to the bed to repeat the process again and again, keeping it up for several days. During all this time the male follows closely behind the female, sometimes quivering and plowing through the sand and gravel in the same way and thus receiving mutilations of the same character. Often the back of the fish is turned against the gravel and becomes worn. On each spawning-bed are usually several supernumerary males, and among them and the paired males there is much chasing about and some fighting which results in still further mutilations. It may, therefore, be positively stated that the sores and mutilations seen on the redbfish at the Idaho spawning-grounds are practically all received after the spawning season begins (B. W. Everman in U. S. Fish Commission Bull. for 1896, Art. 2.)

On the Occurrence of the genus *Reithrodontomys* in Virginia.—On December 6, 1896, I trapped an adult male Harvest

Mouse, *Reithrodontomys lecontii* (Audubon and Bachman) at Fort Myer, Virginia. The trap was set under a fence between cultivated fields and a strip of woodland. I believe this is the most northern point on the Atlantic coast at which a specimen of this genus has been taken; and I know of no published record of its occurrence in the State of Virginia or in the District of Columbia. This specimen is number 83,298 of the United States National Museum collection.—LOUIS ZEREGA MEARNS.

Inheritance of the Monodactyly in the Pig.—The monodactyly, observed in the pig by Aristotle, has persisted to the present time. M. Vasilesen, Professor of Zoology in the Veterinary School at Bucharest, has had the progeny of a male monodactyle pig under observation for a number of years. He notes that of 54 descendants 39 are monodactyle and 13 bidactyle. M. Vasilesen concludes from these observations that the monodactyly of the pig is a hereditary tetralogical phenomenon, susceptible of being transmitted from one generation to another, reproducing itself indefinitely. (*Revue Scientif.*, Oct., 1896.)

Preliminary Description of the Newfoundland Marten.—The marten has long been known as an inhabitant of the Island of Newfoundland, being given by Henry Reeks in 1870 (under the name *Mustela americana*) in his list of the Mammals of Newfoundland.⁶

⁶ The Zoologist (London), 2d Series No. 54, pp. 2033-2049, March, 1870; No. 67, April, 1871, pp. 2540-2553. Notes on the Zoology of Newfoundland. By Henry Reeks.

No. 54, March, 1870, p. 2037, reads as follows:

"*American Sable, Mustela americana, Turton; Pine Marten; Marten Cat* (Newfoundland).—Still common in various parts of the island, but from the increasing, or, at any rate, present value of the fur is annually becoming scarcer. It is a bold rapacious animal, and in its habits remind one much of the common polecat (*M. putorius*). One of the specimens I obtained entered the house of a settler and carried off a dead duck (*Anas obscurus*), but was subsequently shot in a tree near the spot, in fact, while returning for a second duck, having probably hid the other. Marten cats are easily caught by iron traps placed in "cat-houses," or in "dead-falls." Without attempting to settle, or even discuss, the vexed question as to the identity of this species with the European, *M. zibellina*, I may here state that very little reliance can be placed on the colors of the Martine, as a very appreciable difference exists in this particular, even in specimens obtained in Newfoundland and the Labrador, the former being much lighter throughout, but especially about the head and ears. So perceptible is the distinction that a trader readily separates the Newfoundland skins from those obtained on the mainland."

Like most of the mammals of this island it is, however, very different from its mainland cousin, and as no possible connection can now exist between it and the continental form it must rank, a full species, as

MUSTELA ATRATA SP. NOV.—Type from Bay St. George Newfoundland, No. 5752 ♀ adult, coll. of E. A. and O. Bangs. Collected by Ernest Doane Sept. 29th, 1896. Total length 548, tail vertebræ 185, hind foot 89, ear from notch 43.

General Characters.—Size about that of *M. americana* (probably somewhat larger); color very different, suggesting a dark colored mink, rather than a marten; skull slightly different:

Color.—Deep chocolate, becoming black on back, head, arms, legs, rump and tail; a few white hairs scattered along back; chest and under side of neck irregularly blotched with orange; a median line of orange on belly; ears black narrowly bordered all round with dull white; a patch of yellowish-white hairs in front of opening of ear.

Cranial Characters.—Skull about the size or larger than that of *M. americana*; rostrum narrow; audital bullæ much larger and deeper than in *M. americana* and with a more marked "bottle-nose" projection; dentition rather weaker throughout, with greater spaces between premolar teeth, than that of *M. americana*.

Size of the type skull, ♀ "middle aged", adult: Basilar length 69.2; zygomatic breadth 42; mastoid breadth 34.2; breadth across roots of canine teeth 14.2; greatest length of single half of mandible 49.6.

Size.—The type ♀ adult; total length 548, tail vertebræ 185, hind foot 89, ear from notch 43. Of an adult ♀ prototype, (No. 5751 Bangs coll.). Total length 559; tail vertebræ 185, hind foot 86, ear from notch 41.

Remarks.—The above description is based upon two beautiful skins accompanied by skulls, both "middle aged" adult females. Neither has the fur quite "prime," both being taken in September. In its full winter dress, this marten must be a superb creature.

There is a series of eleven skulls of *M. atrata* in the collection of the Museum of Comparative Zoology, at Cambridge, Mass. collected in Newfoundland in 1865 by James M. Nelson. I have examined these and find some of them to be old adults, but all are unsexed. They bear out the characters claimed for *M. atrata*—the large, peculiarly shaped audital bullæ, and the weak dentition, and would seem to indicate that *M. atrata* is a larger animal than *M. americana*.—OUTRAM BANGS.

Zoological News.—According to F. Neri,⁷ who has been studying the beaks of cephalopods, these structures are composed of fibrous cuticular laminae, which chemically are not chitinous but keratinous. The upper part is encrusted with lime.

The results of the Austrian deep sea expeditions of 1890–4 show, according to Dr. R. Sturany,⁸ that the eastern portions of the Mediterranean is much poorer in deep sea shells than the western basin, and further, that the fauna is doubtless of Atlantic origin.

ENTOMOLOGY.¹

The American Spring-tail.—This very anomalous little insect (*Lepidocyrtus americanus* Marlatt) measuring scarcely more than one-tenth of an inch, silvery gray in color, with purple or violet markings, may be frequently observed in houses. In common with the silver fish, it belongs to the order of insects known as Aptera (wingless), from the fact of their having no vestige of wings throughout life.

The simple structure of these insects, and particularly their resemblance to the larval state of winged insects, has led to the belief that they are the primitive forms of insect life. That this is true is, however, by no means certain, and they may rather be degraded or debased examples of some of the higher orders of insects. The species figured herewith is not infrequently found in dwellings in Washington, but is apparently undescribed, and, in fact, little is known of the American species. It is, however, closely allied to a European form (*L. cervicalis*), often found in cellars, and figured by Sir John Lubbock in his monograph on these insects. Another allied European species (*Seira domestica*) has been named from the fact of its being a frequenter of houses.

These insects belong to the suborder Collembola, which (following Sharp) is distinguished from the other suborder of Aptera, Thysanura, by having but five body segments instead of ten, and possessing a very peculiar ventral tube on the first segment, and commonly also a terminal spring, by means of which these creatures leap with great agility, and from which they take their common name of “spring-tails.”

⁷Atti Soc. Tasc. Sci., Nat., x (1896), J. R. M. S., p. 401.

⁸S. B. K. Akad. Wiss. Wein., 1896. J. R. M. S., p. 400.

¹ Edited by Clarence M. Weed, New Hampshire College, Durham, N. H.